

ELEMENTARY ALGEBRA

Monday, January 15, 1912—9.15 a. m. to 12.15 p. m., only

Write at top of first page of answer paper (a) name of school where you have studied, (b) number of weeks and recitations a week in elementary algebra.

The minimum time requirement is five recitations a week for a school year.

Answer the first six questions and two of the others. No credit will be allowed unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient.

- 1 Find the prime factors of each of the following: $1 - x^4$; $x^2 - cx - 2dx + 2cd$; $3a^5 + 3b^5$; $a^4 + a^2b^2 + b^4$
- 2 Divide $4x^0 - 9x^4 + 25 - 14x^3 - x^2$ by $2x^3 - x - 5 + 3x^2$
- 3 Solve $\begin{cases} mx - ny = m^2 + n^2 \\ x - y = 2n \end{cases}$
- 4 Simplify $\sqrt{3} \times \sqrt{48}$; $(5\sqrt{5} - 4)(5\sqrt{5} + 8)$; $3\sqrt{8} \div 15\sqrt{2}$;
6 $\sqrt{\frac{2}{3}} - 5\sqrt{24} + 12\sqrt{\frac{3}{2}}$
- 5 Find the square root of the following:
 $25x^4 - 30ax^3 + 49a^2x^2 - 24a^3x + 16a^4$
- 6 The area of a rectangle is 18 square inches less than twice the area of a square; the width of the rectangle equals the width of the square but the length of the rectangle exceeds that of the square by 7 inches. Find the side of the square.
- 7 A, B and C together have \$1285; A's share is \$25 more than $\frac{1}{5}$ of B's and C's share is $\frac{1}{6}$ of B's. Find the share of each.
- 8 Solve $21x^2 = 2ax + 3a^2$
- 9 Solve $\begin{cases} x^2 - xy + y^2 = 63 \\ x - y = -3 \end{cases}$
- 10 Define root of a number, surd, affected quadratic equation.
Expand $(2a^2 - 3b)^4$